

Why Giannis can't scrub his plate clean: On the absence of resultative secondary predication in Greek

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In this paper, we contrast English and Greek resultative secondary predication, showing that Greek lacks the productive syntactic strategy which English employs. We propose that the difference in productivity should be attributed to properties of the morphology in the two languages (namely, to the differing productivity of certain verbal affixes). Finally, we give a compositional semantics for the complex event formation in the morphology/syntax that accounts for the contrasts between resultatives in English and Greek.

1 Resultative secondary predication in English*

1.1 Empirical characteristics

Resultative secondary predication is attested in a number of languages (occurring in German and Chinese, among many others; see Nedjalkov 1988, Litvinov and Nedjalkov 1988 for a general typology, and see Stowell 1983, Simpson 1983, Carrier and Randall 1992, Fernald 1992, Neeleman 1994, Winkler 1994 for theoretical discussion). Typical examples for English are given in (1).

- | | | | |
|-----|----|---------------------------------------|----------------------------------|
| (1) | a. | The gardener watered the lilies flat. | Simple transitive |
| | b. | The lake froze solid. | Unaccusative |
| | c. | Ben ran his shoes ragged. | Unergative |
| | d. | Marsha will shout herself hoarse. | Unergative with 'fake reflexive' |

These have the 'naive' semantic paraphrases given in (2):

- | | | |
|-----|----|---|
| (2) | a. | The gardener watered the lilies and as a result the lilies became flat. |
| | b. | The lake froze with the result that it became solid. |
| | c. | Ben ran so much that his shoes became ragged. |
| | d. | Marsha will shout so much that she will become hoarse. |

Resultative secondary predication in English is productive, though subject to a number of restrictions well-known from the literature, which are listed below. Most of these will not be our direct concern here, though we will make use of the first one later.

1. *Tenny's Generalization*: Only one result is possible per (complex) event. (Tenny 1987)
2. *Direct Object Restriction*: "A resultative phrase may be predicated of the immediately postverbal NP, but may not be predicated of a subject or of an oblique complement." Levin and Rappaport-Hovav 1995: 34.

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3. Primary predicate must include a ‘process’ (activity or accomplishment, in Dowty’s 1979 terms).
4. The secondary predicate must be stage-level, not individual-level. (Rapoport 1991, Hoekstra 1992)

1.2 *Distracting near relatives to resultatives*

Resultative secondary predication must be distinguished from the other widely attested kind of secondary predication, namely depictives, which we will not be concerned with here (see Andrews 1982, Stowell 1983, Winkler 1994). Both English and Greek exhibit these.

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|-----|----|-------------------------------|----------------------------|
| (3) | a. | Mark drove home drunk. | Subject-oriented depictive |
| | b. | Don’t eat the meat raw! | Object-oriented depictive |
| (4) | a. | O Pavlos odigise methismenos. | Subject-oriented depictive |
| | b. | Mi tros to kreas omo! | Object-oriented depictive |

Resultatives must also be distinguished from the small clause (SC) complements to *want* and *consider* class verbs (see Stowell 1983, Pollard and Sag 1994, Svenonius 1994, Neeleman 1994, and Tsokoglou 1997 for Greek in particular).

- | | | | |
|-----|----|---|--|
| (5) | a. | I want that man dead. | State-of-affairs SC <i>want</i> -complement |
| | b. | We consider Kostas foolish. | Propositional SC <i>consider</i> -complement |
| (6) | a. | Thelo afto ton andra nekro.
<i>want.1sg that the man dead</i> | |
| | b. | Theoroume ton Kosta anoito.
<i>consider.1pl the Kostas foolish</i> | |

2 **Resultative secondary predication in Greek**

2.1 *Basic nonequivalencies*

In Greek, equivalents to the English data in (1) are impossible (as in Arabic and Romance; see Guemann 1990, Fong and Poulin 1998).

- (7) O Giannis skupise to piato tu (*katharo).
the Giannis wiped the plate his clean
‘Giannis wiped his plate clean.’
- (8) Mi potizis ta fita (*epipeda)!
neg water.2sg the plants flat
‘Don’t water the plants (flat)!’
- (9) Prepi na gialisis ton kathrefti (*lampero).
must to polish.2sg the mirror shiny
‘You have to polish the mirror (shiny)!’
- (10) I limni pagose (*sterei).
the lake froze solid

The lake froze solid.

- (11) * O Pavlos etrekse ta paputsia tu lepta.
the Paul ran the shoes his thin
Paul ran his shoes thin.
- (12) a. * I mitera tis anisixise ton eafto tis arosti.
the mother her worried the self her sick
b. * I mitera tis anisixi tin Anna arosti.
the mother her worried the Anna sick

These facts lead us to formulate the broad generalization in (13):

- (13) Syntactic resultative secondary predication (of the English type) is unavailable in Greek.

2.2 *The residue: the apparent exceptions of vafo and its ilk*

We must immediately qualify this statement, however. There are a very limited number of verbs which invalidate the strong form of the above generalization and do seem to support resultative secondary predication of the canonical sort, as in (14)-(16). This class of verbs is morphologically simplex in a way which we will return to immediately.

- (14) Vafo tin porta kokkini.
paint.1sg the door red
'I'm painting the door red.'
- (15) I kori mou theli na kopsi ta malia tis konda.
the girl my wants to cut the hairs her short
'My daughter wants to cut her hair short.'
- (16) Ekane ti zoi mou diskoli.
made the life my difficult
'He made my life difficult.'

One should note, however, that even with these verbs, resultative formation is quite restricted; other imaginable combinations are impossible: **ekane ti zoi mou efkoli* (he made my life easy), **kano kapoion trelo* (make someone crazy), **kovo tin omilia kondi* (cut the lecture short).

As in English, both orders of the object and secondary predicate are possible:

- (17) Vafo {tin porta} kokkini {tin porta}.
paint.1sg the door red the door

In all these cases, the full regular adjectival agreement (number, gender, case) appears on the secondary predicate, though we omit the full paradigm here.

Though most English verbs seem to pattern with this small class of Greek verbs in allowing resultative secondary predication, there is one class of verbs in English as well which seem to correspond to the more general Greek pattern. These are illustrated by the

data below, where resultative secondary predication is impossible with *simplify*, *solidify*, *sharpen*, *redden*, *blacken*, *shorten*, *empty*, *yellow*, *dry* etc.¹

- (18) a. Max simplified the assignment (*easy/*too easy).
b. The lake solidified (*thick).
c. Ben sharpens his knives (*dangerous).
d. The sunset reddened the clouds (*scarlet).
e. Annie reddened (*flushed) with embarrassment.
f. Anti-aircraft fire blackened the sky (*cloudy/*opaque).
g. Smoking will shorten your life (*brief).
h. You should empty the fishbowl (*dry/*clean/*spacious).
i. Age has yellowed the wood frames (*weak/*dry).
j. Leaving clothes on the line overnight always dries them (??stiff).

We turn now to our account of these facts.

3 Accounting for the difference: syntactic structure in the morphology

It has been widely argued that syntactic-like restrictions on argument structure can be captured in the morphology by replicating clausal-like phrase structure in the building of words, i.e., below the X⁰ level (see Roeper and Keyser 1992, Hale and Keyser 1993, Ackema 1995, and Alexiadou and Stavrou 1996). We will pursue this strategy here, though nothing crucial rests upon the particular implementation given.

Where English allows for syntactically-expressed resultatives, Greek productively employs the following resultative suffixes: *-izo*, *-ono*, *-eno*, *-evo*, *-pio* (combining with adjectives or nouns). These very productive suffixes correspond to the more limited number of such suffixes that are used in English, as in (18): *-ify*, *-en*, - (generally

¹ Note that these verbs do allow PP ‘secondary predicates’ (i.e., those which intuitively speaking, supply an endpoint or result) and particles, as shown in (i). These PPs and particles have often been assumed to be essentially parallel to ‘regular’ resultative secondary predication. We take the differing behavior of these and true resultative secondary predications (i.e., APs) with respect to this class of predicates to indicate that this assimilation was premature.

- (i) a. Ben sharpened his knife to a fine point/up.
b. Empty the fishbowl out!
c. The cold reddened our cheeks up a bit.
d. The final edit shortened the film down (by) about three minutes.

A second caveat should be noted here as well: cognate-object-like resultative secondary predication is possible with these predicates, as in (ii).

- (ii) Jack sharpened the knife *sharp/?dangerously sharp/?razor-sharp.

These are ‘cognate-object-like’ in that, like cognate objects, they require some modification of the object (cf. *Jack died {*a death/a horrible death}*). Though the syntax of cognate objects is not well-understood, it is clear that these do not fill a regular argument slot (see Levin and Rappaport-Hovav 1995). If this is so, the ‘cognate’ resultative secondary predications do not invalidate the structural analysis given in the text, since they will be parallel to cognate objects with unaccusatives in the syntax.

deadjectival). Our claim here is that there is no qualitative difference between the grammars of English and Greek with regards to resultative secondary predication; instead the difference is only a matter of degree of morphological productivity. Some examples of the Greek suffixes and the verb they produce are given in (19)-(23).

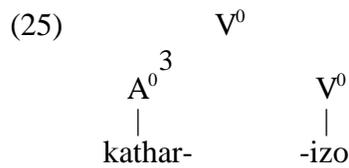
- (19) *-izo*
jializo ‘to shine’; *skupizo* ‘to wipe’; *potizo* ‘to water’; *mavrizo* ‘to blacken’;
kokinizo ‘to redden’; *katharizo* ‘to clean’; *(kse)skonizo* ‘to dust’; *adhinatizo* ‘to
weaken’
- (20) *-ono*
pagono ‘to freeze’; *megalono* ‘to enlarge (cf. *biggen)’; *fortono* ‘to load’;
eleftherono ‘to (set) free’; *xalarono* ‘to loosen’; *stegnono* ‘to dry’; *dhinamono*
‘to strengthen’; *karfono* ‘to nail’; *karfitsono* ‘to pin’; *vidono* ‘to screw’
- (21) *-eno*
mikreno ‘to reduce’; *kondeno* ‘to shorten’; *mareno* ‘to flatten’; *omorfenno* ‘to
embellish’; *asximeno* ‘to make ugly’; *sklireno* ‘to harden’; *paxeno* ‘to thicken’
- (22) *-evo*
dhiskolevo ‘to complicate (make difficult)’; *aplustevo* ‘to simplify’; *majirevo* ‘to
cook’; *genikevo* ‘to generalize’; *kavalikevo* ‘to ride’; *xorevo* ‘to dance’; *stenevo*
‘to narrow’
- (23) *-pio*
xrisimopio ‘to use (make useful)’; *statheropio* ‘to solidify’; *idhiotikopio* ‘to
privatize’; *nomimopio* ‘to legitimize’; *aplopio* ‘to simplify’; *igropio* ‘to wetten’

The sentences in (24) show that resultative secondary predication cannot be used with this sort of verb.

- (24) a. I Theodora aplopiise tin ergasia (*efkoli). *-pio*
Max simplified the assignment (*easy).
- b. To iliovasilema kokinise ta sinefa (*visinia). *-izo*
The sunset reddened the clouds (*scarlet).
- c. I Theodora dhiskolepse tis askisis (*poliplokes) *-evo*
Theodora complicated the exercises (*difficult).
- d. I limni pagose (*sterei). *-ono*
The lake froze solid.
- e. Ta ruxa stegnosan (*sklira). *-ono*
The clothes dried (*hard).
- f. I astinomia eleftherose tus kratumenus (*eftixismenus). *-ono*
The police set the prisoners free (*happy).
- g. Tha kondino ti fusta mou (*eksali). *-eno*
I’ll shorten my skirt (*indecent).

We propose that the presence of resultative morphology reflects a complex structure like ((25)): resultatives in Greek and the limited class of English deadjectival verbs in *-ify*, *-en*, *-* have this structure. With such a structure, no secondary predication

is allowed—not because of any structural deficiency of ((25)), but for semantic reasons which we return to in the next section.



We remain neutral as to whether ((25)) is derived syntactically via raising of A^0 to head-adjoin to the verbal suffix in V^0 , or via a purely morphological rule that derives verbs from adjectives. In any case, in the absence of such morphology, a purely syntactic derivation of secondary predication will be allowed (in terms of small clauses, predication theory, or Larsonian VP-shells, as the case may be—see Larson 1988, Winkler 1994, Bowers 1997). The difference between Greek and English resides in which strategy each language uses more extensively: almost always, Greek resorts to the complex structure in ((25)); English does so only marginally. The reasons for morphological productivity or lack thereof need not concern us—crucial is only that the difference reduces to this, and not to any ‘parameter setting’ for resultative secondary predication *per se*.

4 The semantics of the morphosyntax: Complex eventualities

The generalization that emerges from the above discussion is given in (26):

- (26) **Fact:** If a lexical predicate P encodes an end-state (a result), then no additional resultative secondary predication will be possible with P .

We link the incompatibility of resultative secondary predication with morphologically resultative verbs ending in *-izo*, *-ify*, etc., to Tenny’s generalization (Tenny 1987): only one result may be predicated in an event (no ‘double’ resultative secondary predication, or the like):

- (27) *She wiped the table clean dry.

Our fact in (26) is a simply the lexical case of Tenny’s fact, and we will have nothing to add to the speculations concerning the ultimate reason for such a restriction (see Tenny’s work for discussion). With respect to our data, then, our claim will be the following:

- (28) **Claim:** Predicates that have the complex structure in ((25)) denote complex eventualities, one of which encodes an end-state.

If this conjecture is correct, as seems likely, it follows that these predicates will fall under the fact in (26), as a special case of the ban on multiple result states in a single event.

4.1 *Semantics of eventualities*

To present our account, we need first to make explicit some of the background assumptions, though we will simplify these for reasons of space.

We begin with the simplified ontology for atomic eventualities given in (29), adapted from Aristotle, Ryle-Vendler-Dowty, Kratzer 1996, Landman 1996, Pustejovsky 1995, Parsons 1990. We need to have at least the distinction between events (broadly construed) and states, which we encode in a type difference.

(29)	<i>type</i>	<i>description</i>
	e	events (activities, achievements, accomplishments)
	s	states

Among these types, certain basic relations can be defined, as in (30) and (31).

(30)	<i>strict temporal precedence</i>
	$e_1 < e_2 \quad t_1 \quad t_2 [[AT(e_1, t_1) \& AT(e_2, t_2)] \quad (t_1 < t_2)]$

(31)	<i>implication</i>
	$e_1 \quad e_2$

Following Dowty 1979, Grimshaw 1990, and Pustejovsky 1995, we assume that eventualities may be atomic or complex. The case that will interest us is given in (32), where the branching structure of the complex eventuality e_3 encodes the temporal precedence relation $e_1 < e_2$.

(32)	e_3	
	$\begin{matrix} 3 \\ e_1 \quad e_2 \end{matrix}$	where e_1 is of type e and e_2 is of type s.

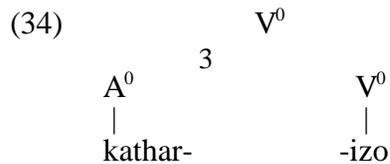
We formalize our claim in (28) simply as follows: affixal resultative verbs denote eventualities of the type in (32).

Lastly, in (33) we define the semantic primitives we assume for action and causation, adapted from Dowty 1979 and Parsons 1990. We are conveniently simplifying the semantics of both of these, eliminating the subevents of DO, and the BECOME relation in CAUS, among other things, for perspicuity. As such, the definitions in (33) should not be construed as serious attempts to capture the meaning of these primitives.

(33)	a.	DO(e,x,y)	e = an event of x doing something to y (i.e., the transitive variant of DO)
	b.	CAUS(e,s) = [e < s & e s]	

4.2 Compositional semantics of the morphosyntax

We are now in a position to present the denotations for the parts of a resultative complex predicate like those in (19)-(23). Recall that we have analyzed these as having the structure in ((25)), repeated here as (34).



We assume uncontroversially that one-place adjectival predicates denote states that hold of an individual; in our neo-Davidsonian event semantics, this is represented as in (35) (see especially Kratzer 1995).



The causativization suffixes, then, should carry the result meaning in them. No other mechanism is needed or, we suppose, available for the formation of lexical resultative predicates. The semantics given here allows only one predicate to be absorbed in composition, therefore no recursion at this level of lexical resultatives will be possible. This encodes the fact that there are no verbs like **flat-dead-en* with the meaning ‘to flatten something so that it becomes dead’, i.e., Tenny’s restriction on multiple results holds also at the purely lexical level. (This seems to hold of Chinese V-V resultative compounds as well, as an inspection of the data in Gu 1992 indicates.) We posit the denotation in (36) for these suffixes, here exemplified by *-izo*.² We existentially close the event variable at this level, in the verb itself, for simplicity in the following derivation—our point is not affected if this is taken out and the event variable is bound by an existential quantifier introduced later in the derivation (at the VP level or higher, as many accounts argue).



This suffix will compose with its adjectival sister in the structure in (34) by function application in the usual manner, yielding (37) for the meaning of *katharizo*:

² This definition ensures that the result state actually holds of the affected object. As pointed out to us by Chris Kennedy (p.c.), a predicate like *widen* seems only to require that the affected object become wider, not wide wrt a standard. We think that this effect is quite general, and a result of a systematic ambiguity arising from aspectual use--these predicates can be used either as activities or accomplishments, with the resulting entailments, as seen in (i). The lack of the ‘absolute’ reading in the activity use is simply a special case of the well-known ‘imperfective paradox’.

- (i) a. We cleaned the road {for an hour/in an hour}.
 b. We widened the road {for an hour/in an hour}.

(37) $y \ x. \ e[\text{DO}(e,x,y) \ \& \ s[\mathbf{clean}(s,y) \ \& \ \text{CAUS}(e,s)]]$

We illustrate the composition of the sentence in (38) in the annotated tree in (39) below (the translations of the relevant nodes are given in (40)), where we translate *to piato* as **the-plate** and *o Giannis* as **g**, respectively. (We ignore any possible verb or DP movements.)

(38) O Giannis katharizi to piato.
the G. cleans the plate
 ‘Giannis is cleaning the plate.’

(39) VP[5]
 $\begin{array}{c} \text{DP} \\ \text{O Giannis} \\ \text{A}^0[1] \\ \text{kathar-} \end{array} \begin{array}{c} \text{V}'[4] \\ \text{V}^0[3] \\ \text{V}^0[2] \\ \text{-izi} \end{array} \text{DP} \\ \text{to piato}$

(40) [1] $s \ x. \ \mathbf{clean}(s,x)$
 [2] $P \ y \ x. \ e[\text{DO}'(e,x,y) \ \& \ s[\text{P}(s,y) \ \& \ \text{CAUS}(e,s)]]$
 [3] $P \ y \ x. \ e[\text{DO}'(e,x,y) \ \& \ s[\text{P}(s,y) \ \& \ \text{CAUS}(e,s)]](s \ x. \ \mathbf{clean}(s,x))$
 $= \ y \ x. \ e[\text{DO}(e,x,y) \ \& \ s[\mathbf{clean}(s,y) \ \& \ \text{CAUS}(e,s)]]$
 [4] $y \ x. \ e[\text{DO}(e,x,y) \ \& \ s[\mathbf{clean}(s,y) \ \& \ \text{CAUS}(e,s)]](\mathbf{the-plate})$
 $= \ x. \ e[\text{DO}(e,x, \mathbf{the-plate}) \ \& \ s[\mathbf{clean}(s, \mathbf{the-plate}) \ \& \ \text{CAUS}(e,s)]]$
 [5] $x. \ e[\text{DO}(e,x, \mathbf{the-plate}) \ \& \ s[\mathbf{clean}(s, \mathbf{the-plate}) \ \& \ \text{CAUS}(e,s)]](\mathbf{g})$
 $= \ e[\text{DO}(e, \mathbf{g}, \mathbf{the-plate}) \ \& \ s[\mathbf{clean}(s, \mathbf{the-plate}) \ \& \ \text{CAUS}(e,s)]]$

The final formula, namely the translation of the VP given in [5] in (40), can be read as ‘There is an event *e* of Giannis doing something to the plate and there is a state *s* of cleanliness which holds of the plate, and *e* is the cause of *s*’, which is the desired result. In a more rough paraphrase, ‘Giannis did something to the plate and as a result the plate is clean’.

5 Conclusions

Since no more than one result may be encoded by grammatical means, either syntactic via resultative secondary predication or morphological via resultative suffixation (Tenny’s generalization), the fact that most verbs in Greek which would be candidates for resultative secondary predication already possess resultative morphology rules out these verbs co-occurring with syntactic resultative secondary predication. This is not a deep fact about the grammar of Greek, we have argued, but rather a side-effect of the very productive affixation of the relevant suffixes. When such lexical encoding of causitivation is absent, as in a very few cases, resultative secondary predication is in fact possible. Viewed in this

light, English simply falls on the other end of the spectrum; indeed we have seen that some resultative suffixation blocks resultative secondary predication in English as well. The presence or 'absence' of resultative secondary predication, therefore, is simply a matter of relative frequency, and will be determined primarily by the productivity of certain morphological processes in a given language.

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